

PATENT

Docket S-96306

REMARKS**Restriction under 35 U.S.C. 121**

Restriction to one of the inventions (claims 1-17 denoted invention I and claims 18-34 denoted invention II) is required. In a telephone conversation with Examiner Tran on 2/3/2004, provisional election with traverse was made to prosecute the invention of group II, claims 18-34. Affirmation of this election with traverse is made by this Amendment.

The Rejection under 35 U.S.C. 103(a)

Claims 18-34 were rejected under 35 U.S.C. 103(a) as being unpatentable over European patent 487102 ("Mori") in view of U.S. patent 5,261,490 ("Ebinuma").

The Applicants respectfully submit that these rejections are overcome since it is believed that claims 18-34 patentably distinguish from Mori, either singly or in combination with Ebinuma. Mori teaches reuse/recycling of the CO₂ captured in the bicarbonate; Mori does not teach sequestering the CO₂ via placing the bicarbonate in a large body of water. Ebinuma teaches sequestration of CO₂ gas by injecting the gas (emphasis added): a) into the ground of the ocean bottom (claims 1, 3); b) in or below layers of natural gas hydrates (claims 2, 8, 11); c) into the ground of the ocean bottom below an impermeable layer (claim 4); d) into the ground of the cold district of high latitude (claims 5, 6, 7). On page 8, lines 39-46, Ebinuma further teaches that the CO₂ gas is converted to liquid form or gas hydrates whereby the CO₂ gas is fixed in the ground of the sea bottom. Ebinuma teaches away from disposal in seawater: a) column 1, lines 25-27 and lines 33-35, "Dumped carbon dioxide cannot be permanently fixed to a place, where the carbon dioxide is dumped, by using the method for dumping carbon dioxide into the ocean ..."; b) column 1, lines 48-51, "When carbon dioxide gas is just dumped into the ocean to be dissolved in seawater, a problem arises concerning the dissolving rate of carbon dioxide gas in seawater"; c) column 8, lines 65-68 to column 9, lines 1-2, "It is noted that the case where carbon dioxide gas is not liquefied and gas hydrate of carbon dioxide is not formed due to a low depths of water in a sea area where carbon dioxide is dumped, carbon dioxide disperses into the ocean. This is beyond the object of the present

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INTRODUCTORY COMMENTS

The Applicants hereby respectfully request reconsideration of the application in view of the subsequent amended claims, and subsequent remarks submitted in response to the First Office Action dated 3/9/2004.

In said Office Action, the following items are noted. 1) the Examiner required Restriction to one of the inventions (claims 1-17 denoted invention I and claims 18-34 denoted invention II). 2) Claims 18-34 were rejected under 35 U.S.C. 103(a) as being unpatentable over European patent 487102 ("Mori") in view of U.S. patent 5,261,490 ("Ebinuma"). Claims 20, 21, 24, 25, 21 and 32 were rejected under 35 U.S.C. 112, second paragraph as being indefinite: a) claims 20, 21, 24 and 25 having no antecedent basis for "the apparatus"; b) claims 31 and 32 having no antecedent basis for "said large body of water".

Claims 1-35 are pending in the application. Claims 1-17 are withdrawn from consideration by this Amendment. The Examiner's rejections are traversed below.

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invention and is not part of the invention"; d) column 11, lines 3-5, "According to the present invention, since carbon dioxide gas is dumped and fixed as gas hydrate of carbon dioxide in a cold district of high latitude, there is no fear of spread of dumped carbon dioxide." In essence, Ebinuma is teaching means for the CO₂ gas to be prevented from coming into contact with the seawater. There is nothing to suggest combining the isolation method of Ebinuma with Mori, since Ebinuma is specific to injecting carbon dioxide gas and not to disposal of a converted CO₂ product (bicarbonate), and since Ebinuma teaches sequestration in the sea bottom not the sea water. Those who have previously suggested injecting CO₂ gas into ocean water as a sequestration method have found it to be ineffective, since the dispersed gas eventually reaches the atmosphere (as disclosed in Ebinuma). The present method of disposal of the bicarbonate into a body of water provides an effective method of sequestering CO₂. The Applicants submit that claims 18-34 of the present invention, as amended, patentably distinguish from Mori and Ebinuma, which either singly or in combination do not teach or suggest the present invention. Mori teaches reuse/recycling of the CO₂ captured in the bicarbonate. Ebinuma teaches away from disposal in seawater. Withdrawal of this rejection is respectfully requested.

The Rejection under 35 U.S.C. 112, second paragraph

Claims 20, 21, 24, 25, 21 and 32 were rejected under 35 U.S.C. 112, second paragraph as being indefinite.

Claims 20, 21, 24 and 25 were rejected for having no antecedent basis for "the apparatus".

As recommended by the Examiner, claims 20, 21, 24 and 25 have been amended to replace the word "apparatus" with the word "method". Withdrawal of this rejection is respectfully requested.

Claims 31 and 32 were rejected for having no antecedent basis in claim 27 for "said large body of water".

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Claim 27 has been amended to include the word "large". Support for this amendment may be found in the original Specification on page 43, lines 8 and 9. The Applicants respectfully submit that there is no ambiguity with respect to the use of the word "large", since page 43, lines 8 and 9 of the original Specification cite rivers, lakes, seas or oceans as exemplary large bodies of water. Withdrawal of this rejection is respectfully requested.

New claim 35 has been added to more particularly claim the subject matter of the instant invention, with respect to disposal of the waste stream below the carbonate compensation depth. Support for this new claim may be found in the original Specification on page 44, lines 10-15.

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CONCLUSION

For the foregoing reasons, Applicant(s) respectfully request(s) that the Examiner allow Claims 18-35, as indicated on the attached complete listing of claims. If the Examiner in charge of this case feels that there are any remaining or unresolved issues, the Examiner is urged to contact the Patent Agent listed below (pacific time zone).

Respectfully submitted,

Date: 4/29/2004

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